Windows World Open

Facsimile Transmittal

Date: March 19, 1993
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Number of Pages: 2
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CONGRATULATIONS !

Your entry has been selected as a finalist in the Windows World Open. Please read the following page carefully, sign and return it to me by fax by noon (Pacific Standard Time) on Friday, March 19, 1993. Sorry for the short turn-around time, but I need to finalize the process and get information to Computerworld to include in their supplement which will feature the contest finalists.

If you have any questions, please call me at 800-829-4143 or 206-443-9673.

Our fax # is 206-443-9674.

Again, congratulations on your winning application.

WAIS for Windows
Description

Background

Wide Area Information Servers (WAIS) is a technology for discovering and retrieving topically diverse information and data from a highly distributed community of information providers. The May, 1991, issue of Byte Magazine includes an article titled "Browsing through Terabytes" that describes the significance of the WAIS technology.

At the US Geological Survey (USGS), WAIS was evaluated and determined to have high potential as a vehicle that would allow researchers to transcend the organizational and philosophical differences inherent in a large research organization. By using WAIS, numerous collections of research citations and data might be easily perused to locate bodies of knowledge that have relevance to a researcher's areas of interest. The potential was also recognized for the use of WAIS in a variety of Federal information search and retrieval applications. These now include projects for Global Change Research, a Federal Spatial Data Clearinghouse, and public access to Federal data and information.

A major obstacle to achieving wide acceptance of WAIS was the lack of an implementation for the Personal Computer platform. A project was undertaken to develop WAIS for Windows, or WinWAIS. Since WinWAIS would be distributed without constraint, it was important to base all components of the product on public domain software offerings. Version 1 of WinWAIS was first released for general use in April, 1991. Version 2 is now available on the Internet and may be acquired from the USGS using anonymous file transfer (FTP).

Functional Capabilities

WinWAIS is invoked by double-clicking on the WAIS program icon. In response, the Query Window is displayed (figure 1). A query is entered by performing two tasks. An English (or other) language description of the desired topic matter is entered in the "Tell me about:" text box, and one or several candidate information sources are selected using the File/Sources menu entry to display the Sources WIndow. Information sources are selected by dragging entries from the "Available Sources" box to the "Selected Sources" box, by double clicking on an entry, or by highlighting an entry and pressing enter. (These three techniques are used wherever they are appropriate throughout WinWAIS.) A search is initiated by clicking the "Search" button, or by pressing enter while the "Tell me about:" box has the focus.

Search progress is reported in the "Status:" box at the bottom of the Query Window. This box may be scrolled to review the 20 most recent status entries.

At the conclusion of the search the "Results:" box is filled in with the titles of references that the various selected information providers determined were most relevant to the query. Also included in results is an indication of relevance (the score), the size in bytes of references that may be subsequently retrieved and presented, and an indicator that identifies the origin of the reference.

References that the searcher determines might contribute to subsequent searches may be dragged from the results box into the "Similar to:" box, or, they may be highlighted with a single mouse click and added using the "Add Document" button. Entries in "Similar to:" are removed by either dragging or highlighting and clicking the "Delete Doc" button. The contents of documents referenced in "Similar to:" are included in subsequent WAIS information queries.

Double-clicking on a "Results:" box entry (or highlighting and pressing enter) selects a reference for viewing. The selected document may be textual or non-textual. Text documents are retrieved and

displayed in the Viewing Window (figure 2). A full range of features including view next or previous, copy, save, print, etc., are available from the Viewing Window. Portions of text documents may also be highlighted and selected for inclusion in the "Similar to:" section of the Query WIndow. Non-textual documents are passed to other Windows applications through descriptions provided via the Setup/Filters menu selection. Figure 2 includes an example of a GIF image weather map displayed using Print Shop Pro as a filter.

An important component of many searches for scientific and technical information is the ability to restrict the search to a defined location (i.e., a place on earth described via a series of latitudes and longitudes). WinWAIS includes the ability to display a world map, position and zoom the map to a desired location, and to use the mouse to "click in" a location to be included in search requests (figure 3). From the Viewing Window, the actual coverage described in a retrieved document may also be displayed. Inclusion of location information in a retrieved document is indicated by making a "Show Map" menu selection visible. The Spatial Locator also allows these entries to be named and saved, and subsequently reloaded and applied in future searches.

Documents retrieved via WinWAIS may contain references to other automated computer systems. Easy access to these systems is accommodated by WinWAIS through the inclusion of an embedded Telnet VT-100 terminal emulator (figure 4). When a reference to another automated system is detected, WinWAIS provides the searcher with a menu option to "Link to" the information source. Telnet is also available from the Query Window.

WinWAIS provides complete integrated setup facilities. Figure 5 illustrates some of the windows that are presented for various configuration tasks. WinWAIS also supports a communications scripting language that provides for easy to use connections to the Internet via dial-up.

Technical Implementation

WinWAIS is implemented at three levels of functionality. All client interactions with the user rely on Visual Basic (VB) to provide an easily maintained and easily customized user interface (the first level).

WAIS core functionality (level two) is implemented as a DLL that includes client, imbedded server, and communications functionality. An Applications Programming Interface (API) approach to communications between VB and the DLL supports specialized applications. An example of this is the ability to implement a macro based version of WAIS in Word for Windows. WAIS.DLL is implemented in Borland C++. WinWAIS may search information sources from a local hard drive or CD-ROM along with geographically remote sources located on the Internet. To access remote sources, socket code was ported from NCSA's popular Telnet offering and made to operate as a component of the WAIS DLL.

Level three consists of a constantly growing family of DLL's that provide the interface between the TCP/IP socket functions imbedded in WAIS.DLL, and various physical communications services. WinWAIS must be able to operate without reliance on commercial products, so assembly language DLL's have been developed that provide direct communications with popular services. These include various Ethernet boards, a Serial Link IP (SLIP) interface for dial-up access to the Internet, and communications via ODI with Novell Netware. Most of the driver DLL's are based on the popular Clarkson University packet driver set, again with liberal modifications to allow them to operate as Windows DLL's. Instructions on how to port other Clarkson drivers are included with the WinWAIS distribution files. A Windows Socket (WINSOCK) interface is now under development, as well.

WAIS for Windows
Benefits

WAIS for Windows is a PC implementation of the client and server portions of a significant new technology. The benefits provided by WinWAIS are derived from making this technology available at no cost to the PC user community. Copies of WinWAIS have been obtained by numerous international, Federal, educational, and private sector organizations. The benefits that WinWAIS brings to the PC population can only be stated as an aggregate of the benefits derived by each user's application of the technology to solve her/his information needs. We cannot quantify the benefits, but can illustrate the potential through several examples.

WinWAIS was initially developed by the USGS as part of an enhancement project for the Earth Science Data Directory (ESDD). The ESDD provides a convenient collection of earth science data citations that may be queried by researchers to determine the availability of data relevant to the researchers areas of interest. WAIS was selected as the technology that best met the objectives of the project. Since project objectives included the ability to access the ESDD from Unix workstations, from the Apple MacIntosh, and from PCs, the development of a Windows based version of WAIS was undertaken.

WAIS' popularity both within the USGS and elsewhere has grown by leaps and bounds. WinWAIS has evolved along with this explosive growth to meet the needs of PC WAIS users everywhere.

For example, WinWAIS was selected by the Department of State as an information discovery tool to be used by the US delegation to the United Nations Conference on Environment and Development (UNCED). UNCED, also known as the Earth Summit, was held in June, 1992, in Rio De Janeiro, Brazil, and was attended by representatives of over 170 countries. The Consortium for an International Earth Science Information Network (CIESIN) has adopted WAIS as an international information sharing tool as a result of the conference, and uses WinWAIS on portable PC's to demonstrate information sharing to foreign governments and institutions.

WAIS has been included in the US Global Research Plan as an information discovery technology that has significance in meeting the objectives of the US Global Change Research Program. WinWAIS was the primary interface used to demonstrate this significance to the senior Federal managers responsible for the plan and its implementation.

Numerous Federal agencies are involved in developing a strategy for providing public access to data and information held by the Federal Government. The availability of public domain interface software that runs on PC's is a prerequisite. The fact that this software may be distributed on CD-ROM to access CD-ROM based information, and also used to access more current information through dial-up or though dedicated networks, is a contributing factor to the inclusion of WAIS technology in public access strategies.

Acknowledgements:

Thinking Machines Corporation is acknowledged for developing the concept and Unix based client/server implementation of WAIS.
The National Center for Supercomputing Applications is acknowledged for their contribution of the TCP/IP sockets code extracted from their public domain Telnet terminal emulator.
Clarkson University is acknowledged for their contribution of Ethernet packet drivers that are used as a model for WinWAIS device driver DLL's.

Screen Captures

Legend:

Figure 1 - Entering a WinWAIS Query

Figure 2 - Viewing Text & Non-Text Documents

Figure 3 - The Spatial Data Locator

Figure 4 - Linking to a Remote System With Imbedded Telnet

Figure 5 - Configuration Windows

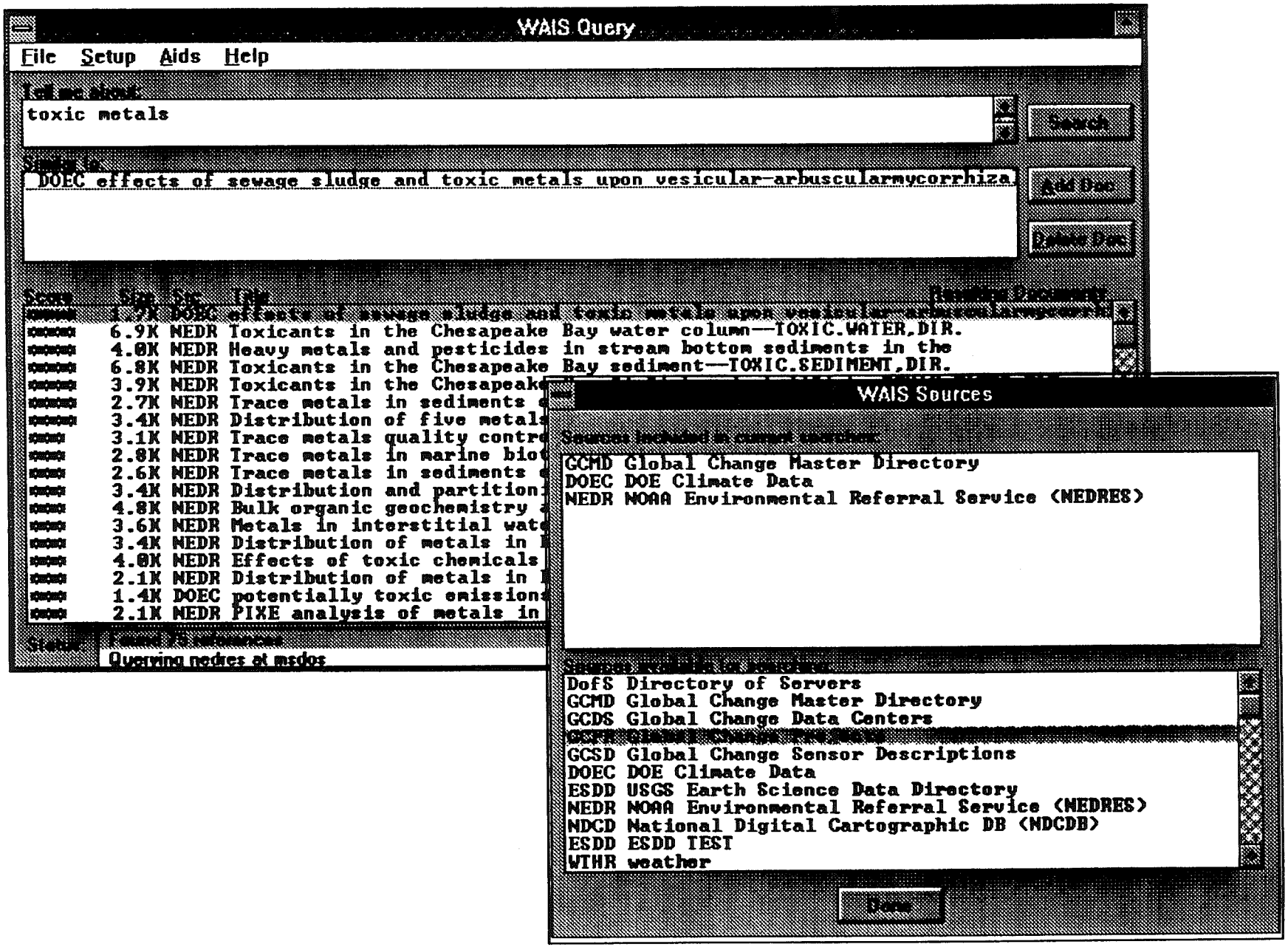


Figure 1 - Entering a WinWAIS Query

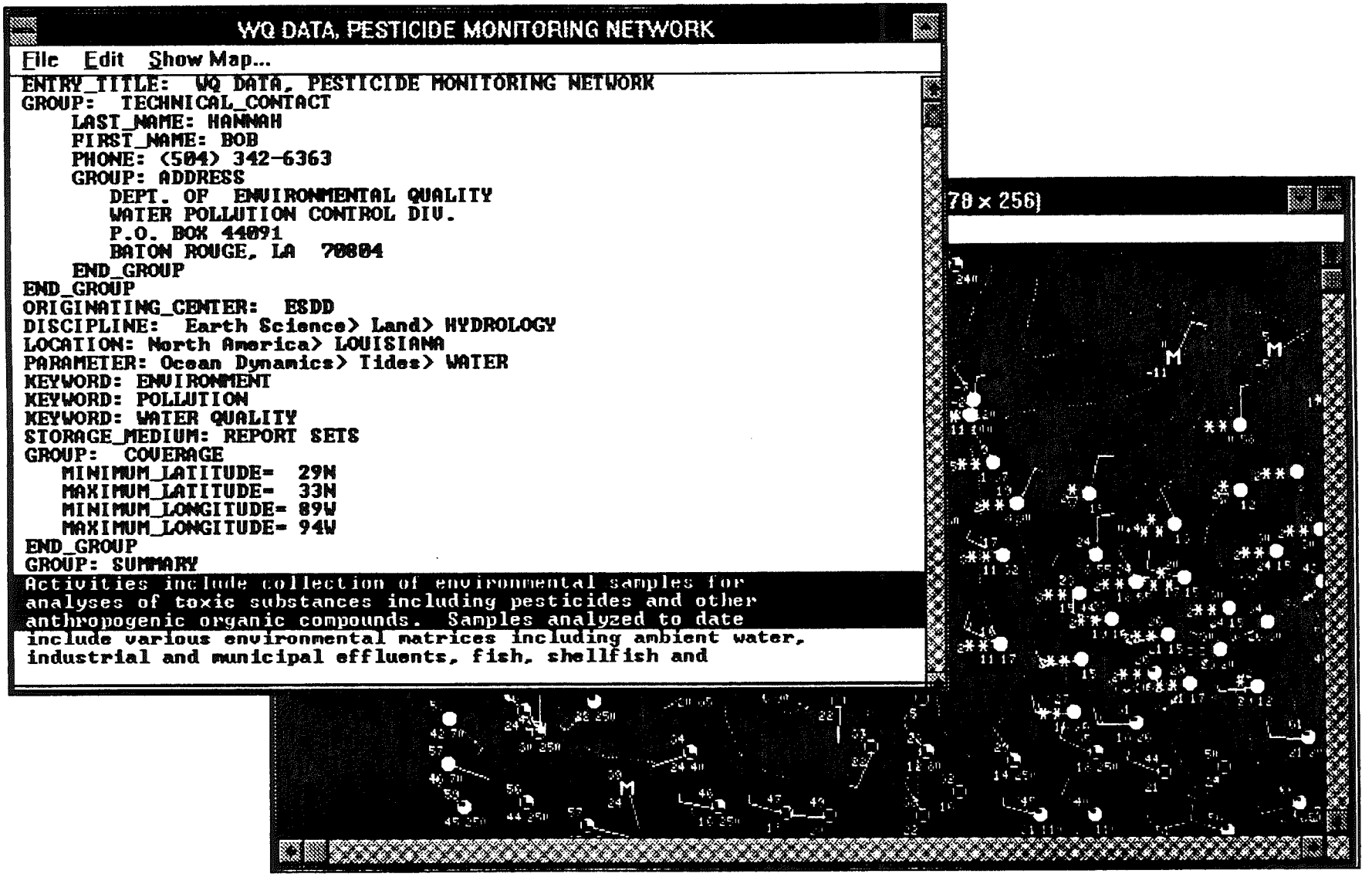


Figure 2 - Viewing Text & Non-Text Documents

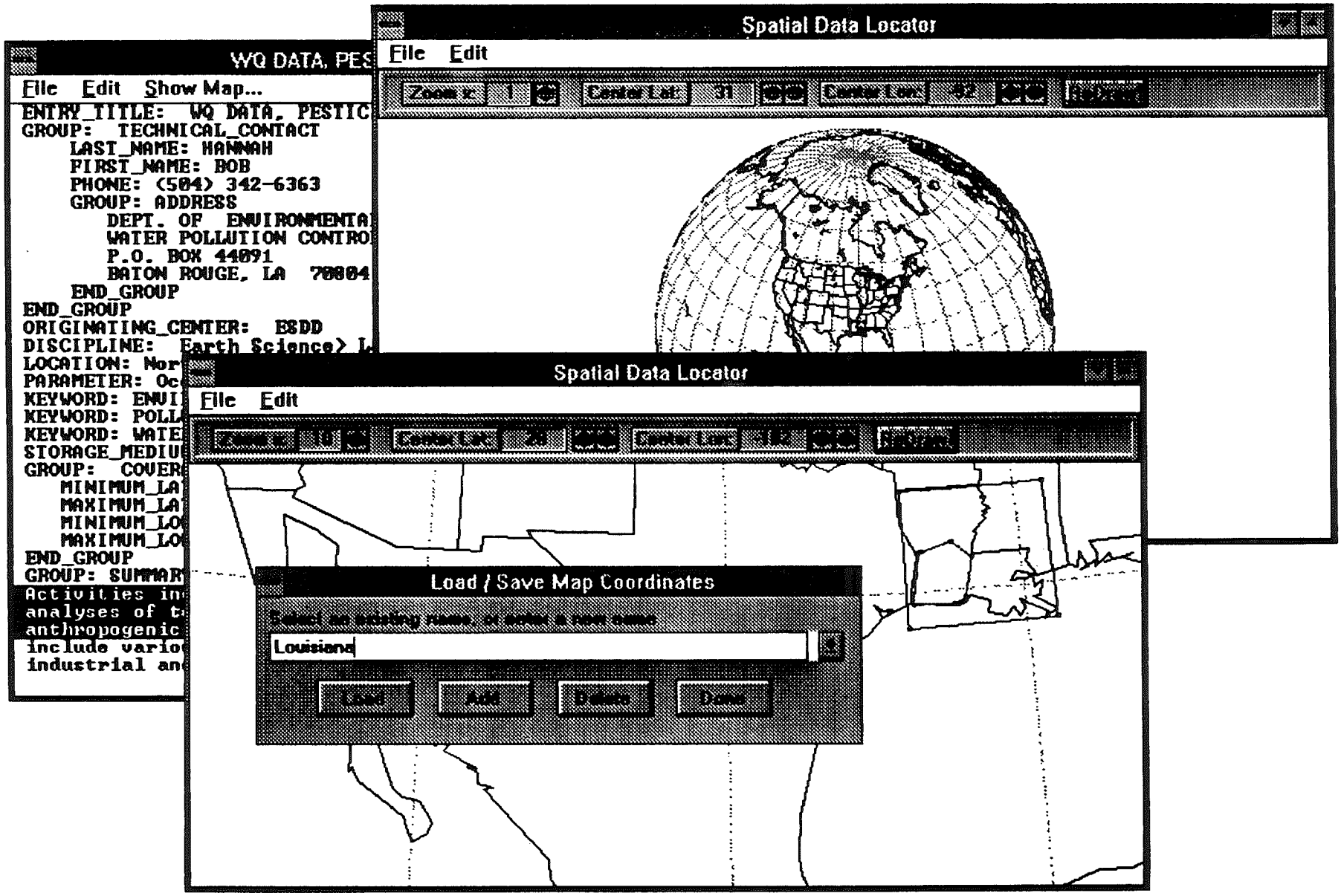


Figure 3 - The Spatial Data Locator

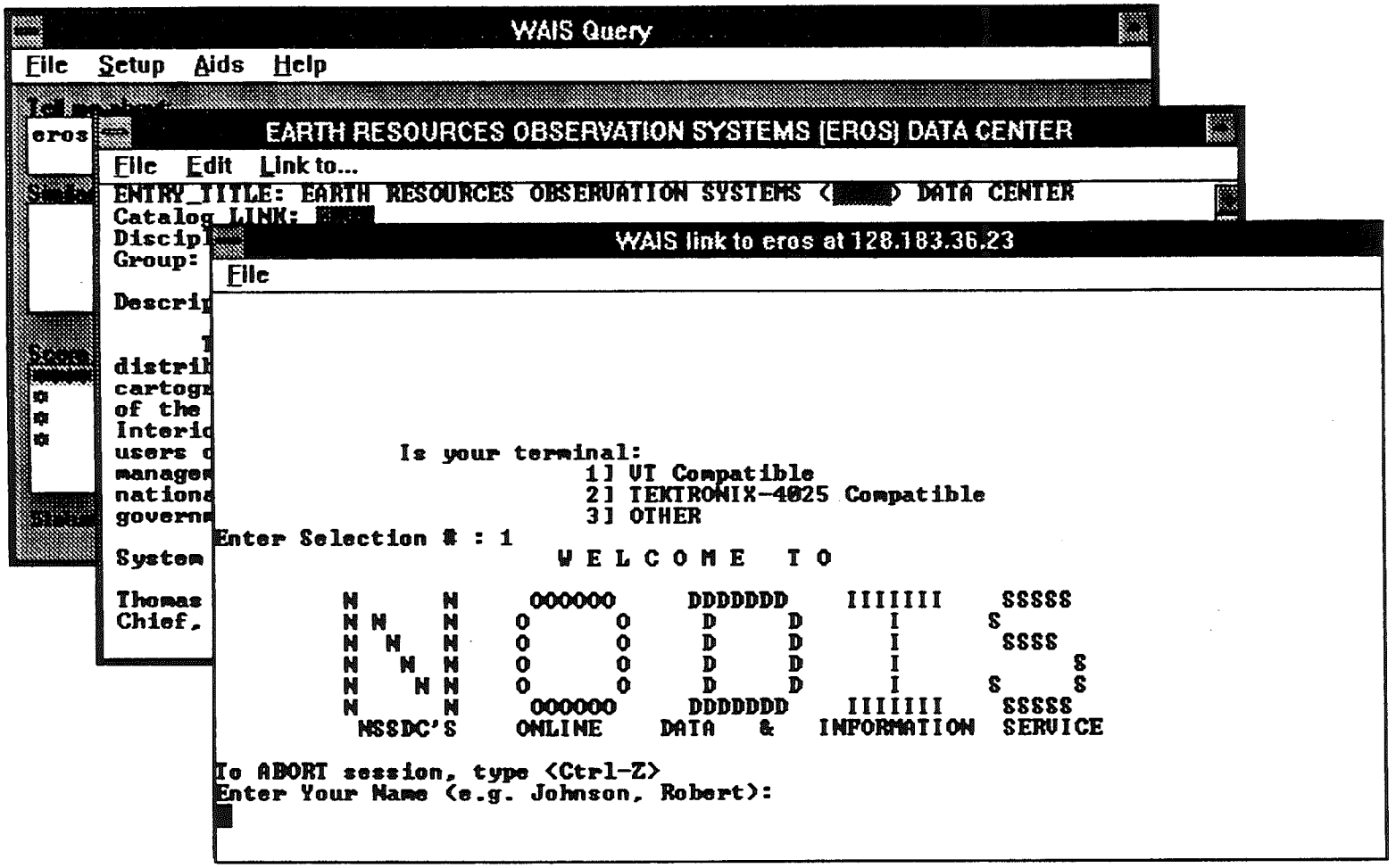
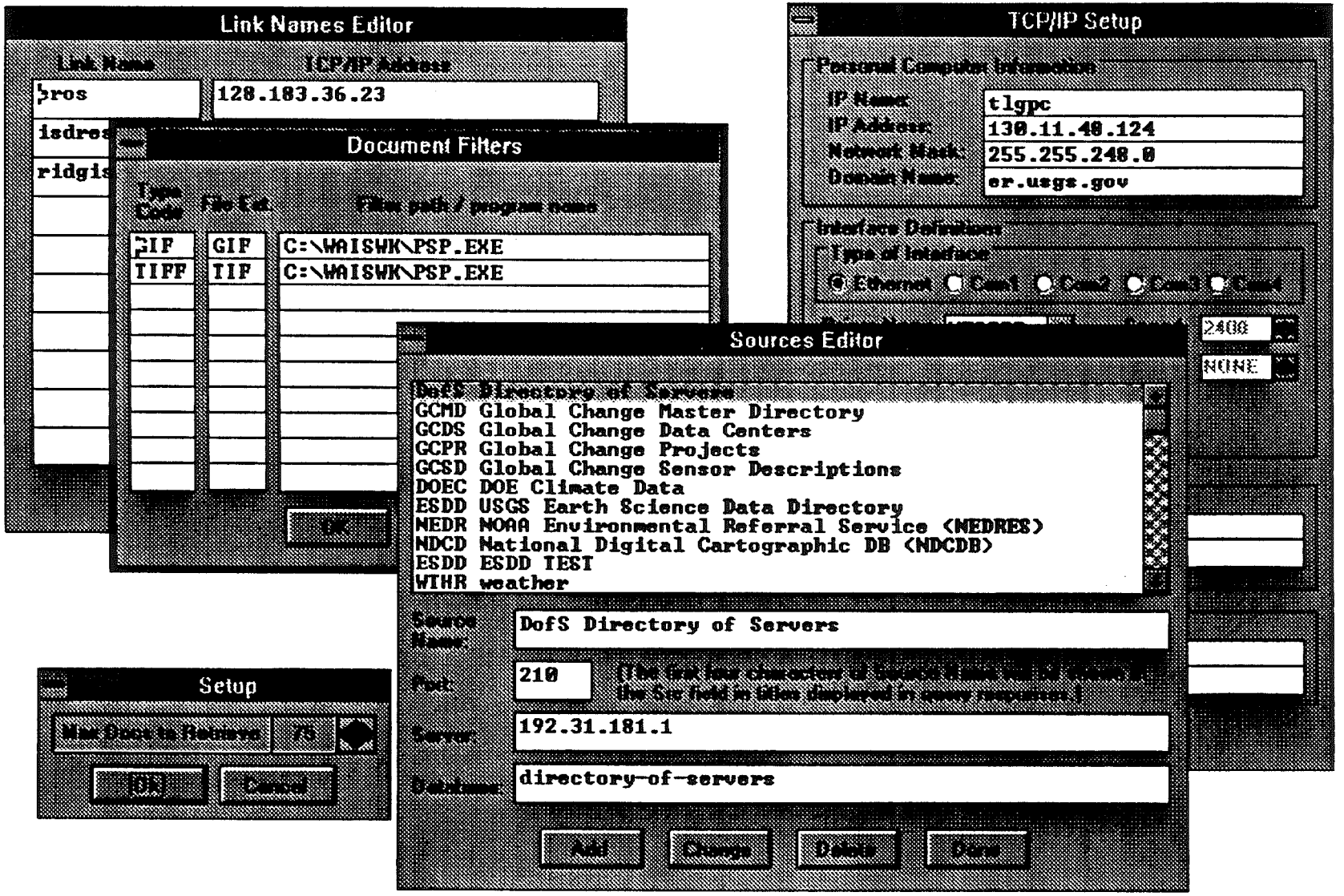


Figure 4 - Linking to a Remote System With Imbedded Telnet



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